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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/004,018	10/18/2001	Kenneth R. Wilsher	65.0272	7752

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EXAMINER

CHAN, EMILY Y

ART UNIT	PAPER NUMBER
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2829

DATE MAILED: 03/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant N .

10/004,018

Applicant(s)

WILSHER ET AL.

Examiner

emily y chan

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to ^{Extension of time} communication(s) filed on 18 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are:

In claims 1 and 7, the functional language "such that current flow through the photoconductive switch is dependent on any difference between voltage of the conductor and the applied voltage" is unclear since there is no connectional structure between the conductor and the voltage applying circuit is recited in the body of claims so it is unclear where and how the difference between the voltage of conductor and the applied voltage is generated. It is also unclear where the current –to-voltage converter is connected in order to perform the function of converting the current flow to a voltage signal. The examiner assumes that the current –to-voltage converter is connected to the photoconductive switch.

Claim 13 is objected to because of the following informalities: "photoconduction switch" should be "photoconductive switch". Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajan et al ('005) in view of Sakai et al ('643).

Rajan et al ('005) teach a method and a charge-particle-beam probe system (see Fig 11A) for probing voltage on a conductor on DUT as claimed, comprising:

- a. establishing electrical connectivity between a conductor (1100) and a first terminal of photoconductive switch (1108) by a probe tip (see Col. 6, line 28 "probe 12");
- b. during a sampling interval n , applying a laser pulse (1105) (see Col. 6, lines 24-26) by a laser pulse (see Col. 12, "beam source"), while applying a voltage to a second terminal of the photoconductive switch by a circuit (see Col. 11, lines 66-67 "a predicted -voltage source");
- d. passing a voltage signal during a gating interval T_{elec} by a gate (1130);
- e. sampling the passed voltage signal to produce a voltage sample for the sampling interval n by a sampling circuit (see Col. 11, lines 3-4 "acquiring a voltage sample at a selected delay t ").

Rajan et al ('005) do not teach the step of converting the current flow to a voltage signal by a current -to- voltage converter.

Sakai et al ('643) disclose a scanning probe microscope for measuring the electrical properties of surface of an electrically conductive sample and expressly teach to provide a current -to- voltage converter in the system for converting a current flow from a photoconductive switch (301) to a voltage signal.

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It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to incorporate the teaching of Sakai et al ('643)'s current – to- voltage converter into Rajan et al ('005)'s voltage sample probing system so that the electrical properties can be detected with high accuracy as disclosed by Sakai et al ('643) (see Col. 13, lines 3-4).

It is noted that Rajan et al ('005)' probe system is a charge-particle-beam probe system and not a laser beam probe system. However, charge-particle-beam and Laser beam are functionally equivalent in semiconductor probe measuring art. The substitution of equivalents requires no express motivation. In re Fount 213 USPQ 532 (CCPA 1982).

With respect to claims 2 and 8, Rajan et al ('005) teach the steps of applying a repetitive test pattern to the conductor (1100) by a tester 14 and synchronizing the sampling interval with the repetitive test pattern appearing on the conductor (1100) by a timing circuit (30).

With respect to claims 6 and 12, Rajan et al ('005) teach the steps of applying the voltage signal to an analog-to-digital converter (32) and enabling the analog-to-digital converter (32) to prepare a digital sample of the voltage signal representing voltage on the conductor.

Allowable Subject Matter

Claims 3-5, 9-11 and would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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Reason for allowanc

Claims 3-5,9-11 and 13 are indicated allowable because the claimed features that the current -to- voltage converter has a rise time which is less than the gating interval ~~T_{elec}~~ for claims 3 and 8, the gate passes the voltage signal only during the gating interval ~~T_{elec}~~ for claims 4 and 10, and gate comprises a pair of transistor Q1,Q2 for claims 5 and 11, and the current -to- voltage converter has a input coupled to receive current flow from the photoconductive switch terminal via a DC-blocking capacitor for claim 13 are not taught or suggested by the prior art.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emily Y Chan whose telephone number is 7033056123. The examiner can normally be reached on 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cuneo Kammie can be reached on 7033081233. The fax phone numbers for the organization where this application or proceeding is assigned are 7033085841 for regular communications and 7033085841 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 7022056123.

EC
March 24, 2003


VINH P. NGUYEN
PRIMARY EXAMINER
GROUP 2829
03/24/03